N18 Ennis Bypass
and N85 Western Relief Road

Site AR122, Clareabbey, Co. Clare

Final Archaeological Excavation Report

for Clare County Council

Licence No: 04E0032

by Kate Taylor

Job J04/02

(NGR 134587 175350)

14th August 2006

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Summary

Site name: N18 Ennis Bypass and N85 Western Relief Road, Site AR122, Clareabbey, Co. Clare

Townland: Clareabbey

Parish: Clareabbey

Barony: Islands

County: Clare

SMR/RMP Number: N/A

Planning Ref. No: N/A

Client: Clare County Council, New Road, Ennis, Co. Clare

Landowner: Clare County Council, New Road, Ennis, Co. Clare

Grid reference: 134587 175350 (OSI Discovery Series, 1:50,000, Sheet 58. OS 6" Clare Sheet 33)

Naturally occurring geology: Yellowish orange boulder clay with frequent manganese flecking

TVAS Ireland Job No: J04/02

Licence No: 04E0032

Licence Holder: Kate Taylor

Report author: Kate Taylor

Site activity: Excavation

Site area: 1240m^2

Sample percentage: 100%

Date of fieldwork: 19th to 22nd February 2004

Date of report: 14th August 2006

Summary of results: Excavation revealed a number of pits and small spreads of material, the majority of which appear to be related to burnt stone producing activity. A pit on the site was dated to the 23rd to 24th centuries BC. A second pit was dated to the 17th to 19th centuries BC. Post-medieval agricultural furrows were also recorded.

Monuments identified: Late Neolithic/early Bronze Age pits with burnt stone and post-medieval furrows.

Location and reference of archive: The primary records (written, drawn and photographic) are currently held at TVAS Ireland Ltd, Ahish, Ballinruan, Crusheen, Co. Clare.

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N18 Ennis Bypass and N85 Western Relief Road, Site AR122, Clareabbey, Co. Clare
A Final Archaeological Excavation Report

by Kate Taylor

Report J04/02o

Introduction

This report documents the final results of an archaeological excavation of several prehistoric burnt stone filled pits (Site AR122) on the route of the N18 Ennis Bypass and N85 Western Relief Road at Clareabbey, Co. Clare (NGR 134587 175350) (Fig. 1). The excavation forms part of the Ennis Bypass Archaeological Contract 7.

A preliminary archaeological report for this site was produced in May 2004 (Taylor 2004).

The National Monuments Act 1930 (as amended) provides the legislative framework within which archaeological excavation can take place and the following government publications set out many of the procedures relating to planning/development and archaeology:

Framework and Principles for the Protection of the Archaeological Heritage (DAHGI 1999a)

Policy and Guidelines on Archaeological Excavation (DAHGI 1999b)

Code of Practice between the National Roads Authority and the Minister for Arts, Heritage, Gaeltacht and the Islands (NRA/MAHGI 2001)

Project background

As part of the National Roads Authority scheme for upgrading the N18 Limerick to Galway Road, Clare County Council, in consultation with NRA Project Archaeologist Sébastien Joubert, requested a series of archaeological investigations along the route of the proposed Ennis Bypass and a Western Relief Road. The proposed scheme has an overall length of 21km and involves the construction of a 13.8km eastern bypass of Ennis from Latoon, north of Newmarket-on-Fergus, to Cragard, north of Barefield. The Western Relief Road is 7.1km long and is to link Killow and Claureen (Fig. 1).

A number of sites of archaeological interest were known to lie on the route of the new roads and the mitigation strategy agreed by the Project Archaeologist and the national licensing authorities for these sites was preservation by record, i.e. full archaeological excavation. Further sites, without surface expression, were located as the result of intensive test trenching along the course of the road (03E1291 Hull 2003 and 03E1293 Roger 2004). As preservation *in situ* was not a reasonable option, the resolution strategy for these new sites was also preservation by record.

The archaeological excavation and post excavation work were funded by Clare County Council through the National Roads Authority and part-financed by the European Union under the National Development Plan 2000-2006.

Location, topography and geology

The site was located in the townland of Clareabbey, parish of Clareabbey, barony of Islands and was centred on NGR 134587 175350 (Figs 1 and 2). The land slopes down gently from south to north, the northern half lying at the edge of a wet marshy area. A small rectified stream flowed through the site, partially truncating the archaeological deposits.

The topsoil varied from a silty loam up to 0.90m thick (including a ploughsoil horizon) at the top of the hill at the south to 0.20m peat at the lower northern end. The underlying natural deposit was a yellowish orange boulder clay with frequent manganese flecking. At the time of the excavation the land was under pasture.

The excavated area sloped from approximately 3.6m above Ordnance Datum (OD) at the south to 2.2m OD at the north.

Archaeological and historical background

As part of the environmental assessment process for the road scheme, Clare County Council commissioned desk-based and walkover surveys that formed part of an Environmental Statement (Babtie Pettit 2000) and an archaeological study for the Environmental Impact Statement (Doyle 1999). A total of 36 sites of known or potential cultural heritage significance were identified along the entire route of the proposed Ennis Bypass and Western Relief Road.

Earthwork and geophysical survey were undertaken on potential archaeological sites and invasive testing and excavation took place in 2002 and 2003 on some of the above ground sites affected by the proposed road (Aegis 2002, IAC 2003, Geoquest 2002, Earthsound 2003).

A systematic programme of testing along the new road route, involving the mechanical excavation of a central linear trench with offsets, took place in Summer/Autumn 2003. Twenty-two previously unknown sites, including cremation cemeteries, burnt stone spreads, enclosures and brick clamps were found (03E1291 Hull 2003 and 03E1293 Roger 2004). Monuments dating from the Bronze Age to the modern period were found.

Earlier phases of archaeological intervention on newly constructed stretches of the N18 (Dromoland to Carrigoran), to the immediate south of this road project, have demonstrated that the locality has a rich range of prehistoric and later monuments (99E0350 Hull and Tarbett-Buckley 2001).

Recent archaeological work on the BGE Gas Pipeline to the West in the neighbourhood of the new road route has tended to support the picture of continuous human activity in Co. Clare from the Neolithic and even becoming intensive from the Bronze Age. A number of burnt stone spreads and burnt mounds were excavated near the route of the new road in the summer of 2002 (MGL 2002).

The area to the west of Clare Abbey was considered to have high archaeological potential due to the proximity of the abbey and the possibility that this was the site of a battle fought between rival elements of the O'Brien Clan in 1278.

Burnt stone spreads and pit clusters, of prehistoric date, were identified during testing and later excavated in neighbouring fields as part of this road project (AR121 04E0031 Taylor 2006a; AR124 04E0022 Hull; 2006a, AR125 04E0023 Hull 2006b). A small cluster of Early Christian pits perhaps associated with metalworking were also found nearby (AR123 04E0019 Hull 2006c) and a post-medieval brick clamp was excavated 350m to the west (AR120 04E0027 Taylor 2006b).

Earlier test excavations

Archaeological deposits were found during the centre-line and offset testing (03E1291 Hull 2003). These deposits were an undated spread of burnt stone and a cluster of three pits. Where archaeological deposits were encountered in test trenches, larger areas were stripped in order to establish the extent of the deposits.

The burnt stone spread measured perhaps 2m by 2m and was cut by a number of plough scars. The spread was sealed by 0.8m of topsoil and ploughsoil. The feature was not excavated but seemed to be thin.

The cluster of three pits was less than 10m to the north-east of the burnt spread. The pits were broadly circular and had diameters of approximately 1.6m, 1.4m and 0.6m. The pit fills were all a silty clay with frequent burnt stone inclusions and charcoal flecking. The smallest pit was half-sectioned and proved to have a depth of 0.3m.

The archaeological features found in the testing were allocated the site number AR122 and are the subject of this excavation report.

Excavation aims and methodology

A licence to excavate was granted to Kate Taylor by the National Monuments Section of the Department of the Environment, Heritage and Local Government, in consultation with the National Museum of Ireland, on behalf of the Minister for the Environment, Heritage and Local Government. The licence number is 04E0032.

The aims of the excavation were to:

1) Preserve by record all archaeological deposits and features within the excavation area
2) Produce a high quality report of the findings

The fieldwork took place between the 19th and 22nd of February 2004 and was supervised by Astrid Nathan and Matthew Logue, assisted by Tim Dean, Elisabeth Dos Santos and Jaime Parra Rizo.

The site encompassed a rectangular area measuring approximately 35m by 31m with a small extension at the north (total area 1240m^2). Topsoil and overburden were removed by a 15 tonne, 360º tracked machine fitted with a toothless grading bucket operated under direct and continuous archaeological supervision. The spoil was visually scanned for artefacts.

Large areas of the site were cleaned using hand tools to fully define the limits of the potential archaeological features. Slots were dug to investigate all possible features and deposits and those that proved to be of archaeological interest were fully excavated.

A full written, drawn and photographic record was made according to the TVAS Ireland Field Recording Manual (First Edition 2003). The site was planned using a combination of digital and hand drawing methods. Digital plans were made using a Global Positioning System (GPS) unit, tied into the N18 surveying base station to provide millimetre accuracy.

Excavation results (Figs 3-4 and Plates 1-4)

The excavation revealed evidence of at least two phases of activity dating to the prehistoric period and the 19th century. Some features have not been assigned to a particular phase. All features and contexts are listed in Appendix 1.

Prehistoric

Eleven pits and a spread of burnt stone contained either concentrations of charcoal, heat-affected stone or both. Whilst it is not possible to directly relate all these features, especially given the distribution across the site, it is likely that they all relate to the same kind of activity – the heating of water with fired stones.

The features at the northern end of the site all had similar fills and, despite root disturbance and flooding, could be seen to be a cluster of associated pits filled with burnt stone and charcoal deposits (Plate 1).

The features in the centre of the site generally contained little or no fire-cracked stone; however the charcoal content suggests that they may have been related to similar activity.

The pits are described in Table 1.

Table 1: Pits

Pit No.	Dimensions (m) (length x width x depth)	Plan Profile	Fill No. and description	Comments
5	0.50 x 0.50 x 0.12	Circular Concave	4: Loose dark grey-black sandy silt with frequent charcoal	Fig. 4
7	1.75 x 1.10 x 0.12	Oval Concave sides, flat base	6: Soft dark grey-black sandy silt with frequent charcoal and occasional fire cracked stone	
19	0.80 x 0.20 x 0.15	Irregular oval Concave	20: Pressed in ploughsoil 18: Loose black sandy silt with frequent charcoal and occasional fire-cracked stone	Fig. 5
24	0.62 x 0.60 x 0.12	Oval Steep sides, concave base	8: Soft dark grey-black sandy silt with frequent charcoal and occasional fire-cracked stone	Possible stone socket
28	0.70 x 0.60 x 0.13	Circular Concave	3: Soft dark grey-black sandy silt with frequent charcoal and occasional fire-cracked stone	
30	0.48 x 0.48 x 0.35	Circular Concave	29: Loose dark grey-black sandy silt with occasional charcoal and occasional fire-cracked stone	Plate 4
38	2.20 x 1.00 x 0.25	Irregular oval 'U'-shaped	35: Compact dark grey-black silty clay with occasional charcoal and frequent fire-cracked stone	Fig. 4
39	1.30 x 0.80 x 0.25	Semi-circular Concave	35: as above	Fig. 4 Plate 3
40	2.00 x 1.40 x 0.40	Oval Concave with lip at north	42: Compact pale grey-brown silty clay with occasional fire-cracked stone 36: Compact dark brown-black silty clay with occasional charcoal and frequent fire-cracked stone 45: soft dark grey clayey silt	Bone from primary fill Fig. 4
41	2.60 x 1.40 x 0.35	Oval Concave	37: Compact black silty clay with rare charcoal and occasional fire-cracked stone	Fig. 4 Plate 2
46	?3.2 x 2.4 x 0.18	Irregular Concave	49: Compact black silty clay with rare charcoal and occasional fire-cracked stone	Flooding prevented full investigation Small amount of burnt bone

Burnt stone spread 9 occupied a shallow depression in the natural geological deposits. The deposit was a dark brown to black clayey silt with frequent charcoal fragments and occasional fire-cracked stones. The deposit measured 1.07m by 0.70m and was 0.11m thick. The spread appeared to have been disturbed by animal burrows.

Post-medieval

A series of cultivation furrows was observed across the drier southern part of the site. These were mostly aligned south-west to north-east but a few examples ran at right-angles to this alignment. The furrows were typically 0.5m wide and 0.1m deep with concave profiles. Although no directly dateable artefacts were recovered from these features, flecks of brick were observed in several of the excavated slots and it is likely that the furrows represent post-medieval agricultural activity, either ploughing or hand cultivation.

The furrows appeared to respect the drainage channel, probably a rectified stream, which itself truncated the burnt stone features at the north of the site. The rectification of the stream probably relates to post-medieval drainage of surrounding agricultural land.

The topsoil in the field contained a moderate amount of 19th and 20th century material such as including white glazed china and transfer printed ware, indicating concentrated activity in the area during this period.

Unphased

Two small features excavated at the northern end of the site were identified as stone sockets. These features, 44 and 48, included occasional burnt stones in their fills, however is likely that this material derived from the surrounding features.

Deposit 25 was a spread of mid brown silty clay with stone inclusions but no charcoal. The sub-circular spread overlay the natural geology and had a diameter of 1.9m and was no more than 0.1m thick. The function and date of this deposit is unclear.

Finds

Artefactual material was recovered from pits 40 and 46 (Appendix 2). Both features produced small assemblages of bone, in one case, burnt or cremated.

The finds have been cleaned, numbered, labelled, properly packed and will be deposited with the National Museum of Ireland in accordance with *Advice Notes for Excavators* (NMI 1997).

Bone by Sîan Anthony

Methodology

Bone from two contexts was examined from Site AR122. Both features were pits containing burnt stone deposits. One assemblage of bone was recovered during excavation; the other came from a soil sample that was wet-sieved to a 2mm fraction. All small pieces of bone were scanned rapidly as in many cases deposits only produced fragments under 1 or 2mm in size. The bones were not separated into size, so percentage fragmentation could not be calculated however the majority of fragments were less than 2mm leaving a lack of recognisable pieces throughout the assemblage.

Human osteological analysis followed recommendations from McKinley (1994, 2000) and Brickley and McKinley (2004). Mammalian bones were identified using standard texts (Hillson 1992 and Getty 1975), all were rapidly scanned and bones damaged on excavation were rejoined and counted as one bone. Small amounts of cremated material were only identified as mammalian only, this does not preclude the possibility that some may be human but could not be readily identified as such. Where they are recognised as animal this is noted.

Results

Only a few pieces of bone were recovered from this site, a single cervid bone, a metapodial shaft, broken into many pieces, probably from a red deer although the animal would have been a juvenile from the size of the refitted pieces. Two small cremated mammalian bone fragments were also recovered. The bone is catalogued in Table 2.

Table 2: Catalogue of bone

Find No	Cut	Deposit	Sample No	Species	Pres.	Burnt?	Colour	Total	Weight (g)	Maximum fragment size (mm)	Comments
04E0032:1	40	45	-	Red deer	G			1	22		Broken into small pieces. Young animal
04E0032:2	46	49	8	Mammal	G	2	White	2	<1	<1	Fragments

Samples

Samples were taken from nine secure contexts across the site: eight were bulk soil samples and there was a single stone sample and a small charcoal sample (Appendix 3). Six of the bulk samples were floated and wet sieved though a 300micron mesh and then through a 2mm mesh in order to recover charred plant material and small artefacts. The heat-affected stone from three samples was retained.

Identification of stone samples by Dr Martin Feely

Introduction

TVAS delivered five plastic bags containing between three and ten stone samples taken from three deposits from AR122, a burnt spread site. The 28 stone samples were identified using a Nikon incident light binocular microscope. Each stone sample in each sample bag has been given a letter and the description of each stone is matched below to that letter (Table 3).

Results

Table 3: Rock types

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Cut	Deposit	Sample	Identification
7	6	5	3 stones: a-b) Medium grained sandstone c) Fine grained siliceous volcanic? rock
41	37	7	15 stones: a) Micaceous sandstone b) Pebbly sandstone c-k) Medium grained sandstone l) Pebbly sandstone m) Micaceous sandstone n-o) Medium grained sandstone
49	46	8	10 stones: a-i) Medium grained sandstone j) Pebbly sandstone

Fragmentation of stones

I see nothing exceptional about the stone samples and the average size of each stone is quite small <100mm to pebble size. They represent material I would expect to encounter in glacial debris. I cannot say that they are smaller fragments of larger heated stones dropped into cold water.

Discussion

In general the stone samples from the Ennis Bypass are either sandstone or limestone. The sandstones are of three main types: a common sandstone, a micaceous variety which has visible “shiny” flakes mica and finally a pebbly variety like a fine conglomerate. The limestone samples all have visible fossiliferous material similar to that found in the Lower Carboniferous limestones of Ireland.

Additional “stone” varieties include fragments of the mineral calcite, quartz and fine grained igneous rocks. The sandstone samples most likely represent Devonian sandstones while there is little doubt that the limestone is Lower Carboniferous in age. This is not surprising as both geological periods are represented by rock exposures in the west and southwest of the country. Glacial debris commonly contains disaggregated blocks of both rock types. The fragments of calcite and quartz probably formed

part of geological structures termed veins, which transect existing rocks. The igneous varieties may represent samples of Carboniferous volcanic rocks but this is speculative.

Charred plant macrofossils and other remains by Val Fryer

Introduction

Six samples for the extraction of the plant macrofossil assemblages were taken from pit fills, with a further sample being taken from the stone spread.

Methods

The samples were floated and wet sieved by TVAS Ireland Ltd, and the flots were collected in a 300 micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16, and the plant macrofossils and other remains noted are listed below on Table 4. Nomenclature within the table follows Stace (1997). All plant remains were charred. The density of material within each assemblage is expressed in the table as follows: x = 1 – 10 specimens, xx = 10 – 100 specimens and xxx = 100+ specimens.

Results

Plant macrofossils

Charcoal fragments formed the principal component of all seven assemblages, although small pieces of charred root or stem were noted in samples 1, 2 and 7. A single fragment of hazel (*Corylus avellana*) nutshell was also recorded from sample 2.

Other remains

Mineralised soil concretions were abundant within the assemblage from the stone spread (sample 2).

Conclusions

The assemblage from the stone spread is closely paralleled by material from *fulachta fiadh* in County Clare and elsewhere in Ireland (Penny Johnston, pers. comm.). As the pit assemblages are similarly composed, it may be reasonable to assume a common source (i.e. fuel residues from the heating processes), although such a link cannot be proved stratigraphically.

Table 4: Charred plant macrofossils and other remains

Sample No	1	2	3	4	7	8	10
Cut No	5		19	28	41	46	46
Deposit No	4	9	18	3	37	49	49
Corylus avellana L.		x					
Charcoal <2mm	xx	x	xxx	x		x	xx
Charcoal >2mm	xx	x	xxx	xx	xxx	xxx	xx
Mineralised soil concretions		xxx					
Sample volume (litres)	2	5	8	2	18	20	
Volume of flot (litres)	<0.1	<0.1	0.3	<0.1	0.3	0.2	0.1
% flot sorted	100%	100%	50%	100%	50%	50%	100%

Charcoal by Simon Gannon

Introduction

Seven samples of charcoal fragments were retrieved from six contexts from the site, consisting of a burnt spread. Identification of taxa of the retrieved charcoal may assist in the reconstruction of the local, contemporary woodland-environment and the use of the woodland resources by the people responsible for the archaeological features.

Methodology

In sorting fragments suitable for identification a guide size of at least 2mm in radial cross-section was used. In this sort some samples were found to contain an unusually large number of fragments and sub-samples were taken, as detailed in Analysis Results.

Initially the grain direction of the fragments was identified before fracturing across their transverse plains. Identifications were made under microscopic examination, in most cases. Further fractures were made to reveal radial and/or tangential plains in cases where identification was more difficult. Magnification of between x10 (hand lens) to x400 was used. Structural elements of the fragments were examined to allow for identification of roundwood, heartwood, and sapwood features.

Reference material comprised a reference collection of charred samples of taxa and reference publications, *Microscopic Wood Anatomy* (Schweingruber 1990) and *The Identification of the Northern European Woods* (Hather 2000).

Analysis Results

The results are summarized in Table 5. Classification follows that of *Flora Europae* (Tutin *et al* 1964-80). Certain related taxa cannot be securely differentiated on the basis of their anatomical characteristics and are assigned to their respective family groups as with the genera *Salix* and *Populus,* and the genera *Craetaegus, Malus* and *Sorbus.* Provisional identifications have been given in cases where the condition of the charcoal was degraded.

The various identifications of wood taxa were consistent with taxa from the following groups:

<u>Broadleaf taxa</u>
Betulaceae. *Alnus* sp., alder.
Corylaceae. *Corylus* sp., hazel.
Fagaceae. *Quercus* sp., oak.
Oleaeceae. *Fraxinus* sp., ash.
Rosaceae.

Subfamily Pomoideae. *Craetagus* sp., hawthorn; *Malus* sp., apple; *Sorbus* spp., *Sorbus aucuparia*, rowan; *S. aria,* whitebeam; *S. hibernica,* Irish whitebeam, and other *Sorbus* species.
Prunus sp., *Prunus avium,* wild cherry; *P. spinosa,* blackthorn; *P. padus,* bird cherry.
Rosa sp., rose.

Salicaceae. *Salix* sp., willow; *Populus* sp. poplar.

<u>Coniferous taxa</u>
Cupressaceae. *Taxus* sp. yew.

Discussion

Anatomical characteristics from charcoal fragments do not allow for identification of individual species in every case. Several species belong to groups of species, species of genera, of sub-families

and of families that cannot be separated anatomically (Schweingruber 1990 Hather 2000). It is possible that a narrow range of species and, occasionally, one or two species can be indicated with a degree of confidence due to established factors, principally their native status and history of introduction by people (Huntley and Birks 1983, Peterken 1996 and Scannell and Synott 1987). The following section places the given charcoal based taxa identifications in the context of defined tree species allowing for implications related to their environmental characteristics and possible use by ancient peoples to be drawn. Consulted references included Goldstein et al 1984, Hather 2000, Huntley and Birks 1983, Kelly 1998, Mitchell 1978, O'Sullivan 1996, Rackham 1976-1990, Raftery 1996, Rossen and Olson 1985, Scannell and Synott 1987 and Tutin et al 1964-1980.

Taxa descriptions

Alder

The sole native species is *Alnus glutinosa*, Common Alder, Irish fearnóg (family – Betulaceae).
Environment indications. Tolerant of nearly all soil types including relatively infertile soils, such as ironpan and peaty soils. Particularly tolerant of water logged conditions and is often a streamside tree. Has the ability to 'pioneer' into previously disturbed land. Native distribution throughout Ireland.
Uses in antiquity. A hardwood suitable for a variety of artefacts and smaller structural timber. Tends to harden when in contact with water and therefore suitable for making piles etcetera. It burns quickly when used for firewood but has been found suitable for charcoal production.

Ash

There is a single native species, *Fraxinus excelsior*, ash, fuinseog (family - Oleaceae).
Environmental indications. Requiring deep, fertile, moist but well drained, soils. Grows well in mixed stands when not shaded. Widespread throughout Ireland.
Uses in antiquity. A strong but elastic wood suitable for many purposes including structural timber (not where in prolonged contact with water or soil). Coppices readily. Burns well even when green, partly due to low water content.

Blackthorn/ cherry

Here there are three native species, wild cherry, *Prunus avium*, crann silin; blackthorn, *Prunus spinosa*, draighean and bird cherry, *Prunus padus*, donnroisc. (Family - Rosaceae).
Environmental indications. Tolerant of most soils, preferring well-drained, acid, neutral and alkaline soils. Can grow in semi-shade, e.g. light woodland, or no shade, requiring moist soil. *P. spinosa* is common as a shrub in woods, can grow in semi-shade, scrub, often forming thickets, sometimes small trees. *P. spinosa* is a pioneer species, invading cultivated fields. Natural distribution throughout Ireland. *P. padus* native over more northern parts of Ireland.
Hazel

There is a single native species, *Corylus avellana*, hazel, coll (family - Corylaceae).
Environmental indications. Botanically a shrub, but does not flower and fruit without sunlight, so is really a canopy tree preferring woodland edges and clearings though it bears moderate shade and is also found as understorey, typically in oak woodlands. Fairly tolerant of poor soils but does not grow on acid soils and preferring chalky, fertile, deep soil. Growing throughout Ireland.
Uses in antiquity. A tough and flexible wood, useful for small implements and small structural elements. Also grows easily in coppice-like form producing rods suitable for wattle and basketry type structures. Makes useful firewood.

Hawthorn/ *Sorbus*

The represented species is probably one or more of the following native members of the sub-family Pomoideae that includes several *Sorbus* species. (Family - Rosaceae).

Crab Apple, *Malus sylvestris*, cran fia-úll; hawthorn, *Crataegus monogyna*, sceach geal.
Environmental indications. Both species. Very rugged and adaptable to almost any climate and most soil types, requiring moist soil and can grow in semi-shade or no shade. Natural distribution throughout Ireland.
Uses in antiquity. Both species produce a very hard close grained wood, suitable for small implements such as mallets and splitting wedges. Both species make excellent fuel; *C. monogyna* can also make livestock barriers and is noted for being the hottest firewood.

Sorbus. One or more of the native group of at least six species that includes, the most widespread rowan, *Sorbus aucuparia*, caorthann, as well as whitebeam, *Sorbus aria*, fionncholl coiteann; and Irish whitebeam, *Sorbus hibernica*, fionncholl ghaelach.
Environmental indications. General. Very tolerant of soil quality generally, though requiring moist soil. Tolerating light shade, though fruiting better in a sunny position. Effective pioneer, Rowan natural to all of Ireland. Other *Sorbus* species native to Ireland have a much more restricted range within Ireland and elsewhere, with Irish whitebeam found only in Ireland.
Uses in antiquity. Heavy, close grained hard wood suitable for carving and useful for making bows, tool handles, mallet heads and, if sizable, beams etcetera. Coppices well.

Oak

There are two native species, pedunculate oak, *Quercus robur*, dair ghallda and sessile oak, *Quercus petraea*, dair ghaelach. (Family - Fagaceae).
Environmental indications. Broadly soil tolerant. *Q. robur* preferring alkaline or neutral soils rich in minerals, particularly damp clay soils and usually found in mixed woodland. *Q. petraea* preferring acid and lighter well drained soils, often in pure stands. Both species are naturally distributed throughout Ireland.
Uses in antiquity. Both species produce a hard wood resistant to abrasion and water degradation, particularly useful for structural timber and implements, poles and fencing. Woodland trees can be coppiced to produce stakes, straight poles etcetera. The density of oak wood makes for an optimum long lasting fire fuel.

Rose

Native species are dog rose (*Rosa canina*) and field rose (*Rosa arvensis*).

Environmental indications. These are deciduous shrubs that grow in woodlands and on woodland margins. Tolerant of a wide range of soils, thriving on neutral, lime-rich and heavy clay soils. Dog rose (*Rosa canina*) is found throughout Ireland with the field rose (*Rosa arvensis*) also widespread but restricted in the west.
Uses in antiquity. These are both hardwoods that may have been useful for making small implements.

Willow /poplar

The Salicaceae family provides various possible individual species, native to Ireland, including ten or more from the genera of willows and one from the genera of poplars.

Willow
There are ten or more willow species native to Ireland, though some having restricted range. Examples of the more widespread species being eared willow (*Salix aurita*), crann sníofa; goat willow (*Salix caprea*), sailchearnach; and grey willow (*Salix cinerea*), saileach liath.
Environmental indications. Extremely hardy and tolerant of a wide range of soils and habitats, often growing in, though not restricted to, wet places. Not tolerant of drought. *S. cinerea* and *S. purpurea* are not particularly shade tolerant, *S. caprea* is reputably more tolerant of shade. These are ‘pioneer’ species and can move into areas where the soil has been disturbed such as cleared woodland.

Uses in antiquity. Very tough and flexible wood useful for woven structures. Brittle branchwood not suitable as timber breaks violently when burnt. The stems are very flexible. Coppiceable, it can produce stout poles.

Poplar
Aspen, *Populus tremula*, crann creathach.
Environmental indications. Tolerant of poor soils growing on scrub, frequent on damp sites on hillsides, in rocky valley bottoms. A woodland tree where not under canopy. Moderately tolerant of drought as mature tree, not at all as a seedling. A short-lived pioneer tree. Native to Ireland.
Uses in antiquity. Wood is very soft with limited usefulness, of low flammability but making good charcoal.

Yew

The native species is yew, *Taxus baccata*, iúr (family - Taxaceae).
Environmental indications. Growing on limestone and chalk in woods and scrub, often occurring in dense shade of oak woods. Also can form pure stands in sheltered sites. Natural distribution throughout Ireland.
Uses in antiquity. A heavy, hard, durable, and elastic wood, resistant to water. Useful for structures, bows, tool handles etc. Makes good firewood.

The total range of taxa from AR122, Clareabbey, comprises alder (*Alnus*), ash (*Fraxinus*), cherry/ blackthorn (*Prunus*), hawthorn/apple/*Sorbus*-group (Pomoideae), hazel (*Corylus*), oak (*Quercus*), rose (*Rosa*), willow/ poplar (Salicaceae) and yew (*Taxus*). There is a relatively varied diversity of species indicated in the local environment. The represented taxa belong to the groups of species represented in the native Irish flora and, conversely, non-native tree species such as lime (*Tilia*) and beech (*Fagus*) are not represented.

Generally, there are various, largely unquantifiable, factors that effect the representation of species in charcoal samples including bias in contemporary collection, inclusive of social and economic factors, and various factors of taphonomy and conservation (Théry-Parisot, 2002). On account of these considerations the identified taxa are not considered to be proportionately representative of the availability of wood resources in the environment in a definitive sense and are possibly reflective of particular choice of fire making fuel from those resources.

Ash (*Fraxinus*) is the most numerous of the identified taxa and is the second most commonly represented from the total of Ennis Bypass sites. As noted above ash (*Fraxinus*) is a particularly useful fire fuel as well as being a likely commonly used structural/artefactual wood. The frequency of oak (*Quercus*) is very low in comparison to ash (*Fraxinus*), a ratio also found at the Clareabbey site, AR124. Rose (*Rosa*), in a single fragment from Sample 8, Context 49, is a uniquely represented taxa from the total of Ennis Bypass sites suggesting that this taxon was probably rare in the local environment or, if from a relatively late deposit, not previously present in that environment.

Conclusion

A varied woodland environment local to the site of AR122 is indicated by the range of taxa present in the samples. The identified taxa are consistent with the picture of wood use from the total of Ennis By-Pass sites apart from the unique use of rose (*Rosa*). The charcoal of the site has probably derived from fire fuel debris, and a particularly ready access to, and possible preference for ash (*Fraxinus*) is indicated.

Table 5. Number of identified charcoal fragments per sample

Sample	Cut	Deposit	Context type	*Alnus*	*Betula*	*Corylus*	*Corylus/ Alnus*	*Fraxinus*	Pomoideae	*Prunus*	*Quercus*	Rosa	Salicaceae	*Taxus*	*Ulmus*
1	5	4	Pit	-	-	-	-	-	-	39 (4r)	-	-	-	-	-
2		9	Spread	-	-	-	1	1	-	-	-	-	-	-	-
3	19	18	Pit	3	-	12	58	20	-	-	3	-	-	-	-
4	28	3	Pit	-	-	2	17	-	-	-	-	-	-	-	-
7	41	37	Pit	-	-	2	3	90	-	3	-	-	2	-	-
8	46	49	Pit	-	-	-	7	51	3	-	1	1	-	30	-
10	46	49	Pit	-	-	-	3	13	-	-	1	-	-	-	-

(r: roundwood)

Radiocarbon dates

Two radiocarbon determinations from charcoal from two of the pits were made by Beta Analytic Inc, Miami, Florida (Table 6).

Table 6: Radiocarbon determinations

Sample material	Cut	Deposit	Sample	Lab code	Radiometric age	Calendrical calibrations
Charcoal Corylus	41	37	7	Beta-211575	3430±40 BP	2 sigma (95%) Cal BC 1870 to 1630 1 sigma (68%) Cal BC 1760 to 1690
Charcoal Corylus/ Alnus	46	49	10	Beta-211576	3820±40 BP	2 sigma (95%) Cal BC 2430 to 2140 1 sigma (68%) Cal BC 2310 to 2200

The charcoal sample was from short-lived tree species. The radiocarbon determinations may, then, be a relatively accurate indicator of the dates of the backfilling of the two pits. One of the pits was most probably backfilled in the late Neolithic/early Bronze Age, and the other, after at least a 300 year hiatus, in the early Bronze Age.

Discussion

The excavation of site AR122 at Clareabbey, Co. Clare has produced evidence of late Neolithic/early Bronze Age activity that produced burnt stone, and of post-medieval agriculture represented by furrows made by either ploughing or hand-tillage.

Eleven pits and a deposit contained either concentrations of charcoal (mostly of wood from the ash tree), heat-affected stone or both. It is not clear what specific activity the features represent; however it is likely that the stone was used to heat water in a similar manner to *fulachta fiadh*, with the excavated pits perhaps acting as troughs. The natural clay deposits at the northern end of the site were impermeable, meaning that the pits would not require lining in order to hold water. The northern concentration of pits was located at the edge of a low-lying bog and was truncated by a drainage channel, probably a rectified stream, indicating that the location would have been ideal for activities that required fresh water. The presence of a small assemblage of bone at the base of one of these pits suggests that they were perhaps used for cooking or preparation of animal hides. It is interesting that bones from a young red deer were found. Perhaps the consumption of a wild animal had a special meaning.

Three other deposits of charcoal-rich, burnt stone have been found nearby as part of this road project:

Site AR121 (04E0031 Taylor 2006a) was 275m to the east of Site AR122 and was characterised by a spread of burnt stone with no cut features such roughs. A radiocarbon date from Site AR121 indicates that stone was heated in the later Bronze Age (2 sigma Cal BC 1000 to 820).

Part of a burnt stone mound and a trough were excavated 130m to the west of Site AR121 (AR124, 04E0022 Hull; 2006a). The stone-filled trough from that site was radiocarbon dated to the early Bronze Age (2 sigma Cal BC 2200 to 1960).

A burnt stone deposit (AR125, 04E0023, Hull 2006b) was located 220m west of Site AR121. This site was similar to those described above, but was destroyed by construction contractors and has not been dated.

The four sites (AR121, 122, 124 and 125) are sited on the flood plain of the River Fergus and, even though modern river defences have relieved much of the seasonal flooding that must have been associated with the river, are within a very wet and boggy landscape.

Approximately 2km to the west, and located next to a small river, also prone to flooding, a further seven shallow burnt stone spreads were excavated as part of this road project (AR127, 04E0028, Taylor 2006c). These stone spreads were very similar to Site AR122, in that they were amorphous, shallow and were not associated with cut features such as troughs. Six of the stone spreads produced radiocarbon dates focussed on the late Neolithic/early Bronze Age transition and the seventh stone spread was dated to 10th to 12th centuries BC.

Also excavated 2km the west of Site AR122, was a large crescent-shaped *fulacht fiadh* with a stone-lined trough (AR126, 04E0024, Hull 2006d). This monument was used in the late Neolithic/early Bronze Age and then re-used in the late Bronze Age.

It has been argued that *fulachta fiadh* seem to occur in the proximity of habitation enclosures (Cooney and Grogan 1994) and that these monuments may have formed part of a social 'round', in which individual family groups hosted reciprocal ceremonial activities for the local community (Grogan 2005).

The archaeological site excavated at AR122 is within the south-east part of County Clare and this region is one of the foci of recently published Discovery Programme research (Grogan 2005). *Fulachta fiadh* in the South-East Clare landblock have been shown to tend to occur in clusters and to be sited on land that was wet. The group of burnt stone sites at Clareabbey (AR121, AR122, AR124 and AR125) are certainly clustered and located on the flood plain of the River Fergus, but the usage span of the three dated sites was at least a thousand years. It might be then, that it was the wet environment that was the deciding factor, at least for this group of burnt stone sites. This said, it should be noted that the cluster of six similar burnt stone spreads at Cahircalla More (AR127) did exhibit a degree of contemporaneity, also focused on the late Neolithic/early Bronze Age.

Fulachta fiadh, in general, seem to have a floruit in the middle/late Bronze Age (Grogan 2005 and Brindley *et al.* 1990). While the burnt stone spread and pits at AR122 cannot be described as a classic *fulacht fiadh* (i.e. there is no significant crescentic mound or large trough), the late Neolithic/early Bronze Age dates, as well as the re-use of the site over at least three centuries indicates a tradition of stone-heating activity across many generations.

The BGE Gas Pipeline to the West and the N18 road scheme from Latoon to Ballycasey both produced dated burnt stone deposits. Further integration of the results of the radiocarbon dated burnt stone sites excavated as part of the N18 Ennis Bypass and N85 Western Relief Road and other infrastructural projects in the upper Fergus estuary would add significantly to interpreting these ubiquitous site types.

Archaeological potential off the road CPO

The archaeological deposits were fully resolved within the road CPO, although the wet nature of the ground outside the CPO and the presence nearby of Clare Abbey might indicate a reasonable potential for further deposits without surface expression.

Publication plan

A summary of the findings of the excavation has been submitted to *Excavations 2004*.

Copies of this final excavation report will be deposited with the Clare County Museum and the Local Studies Library, Ennis, Co. Clare

A summary article, describing the findings of this road project has been published in the local journal *The Other Clare* (Hull and Taylor 2005).

An illustrated information brochure describing the findings of this road project has been published by Clare County Council.

The stated aim of the National Roads Authority with regard to archaeological publication is clear, (O'Sullivan 2003) and it is anticipated that the results of this excavation will be disseminated as a component of a monograph dedicated to the archaeology of the Ennis Bypass. Publication is expected to take place in 2006/7 at the latest.

The radiocarbon dated *fulachta fiadh* and burnt stone spreads excavated as part of this road project and a number of other dated burnt stone sites, excavated by the author and others on the BGE Gas Pipeline to the West (Grogan forthcoming), on the west bank of the upper Fergus estuary would make an informative article in a national journal and would provide valuable comparative data to supplement the Discovery Programme research programme. It is proposed to discuss this thematic and regional publication with the Project Archaeologist Sébastien Joubert and with Eoin Grogan.

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Kate Taylor MIAI MIFA
TVAS Ireland Ltd
14th August 2006

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Appendix 1: Catalogue of features and deposits

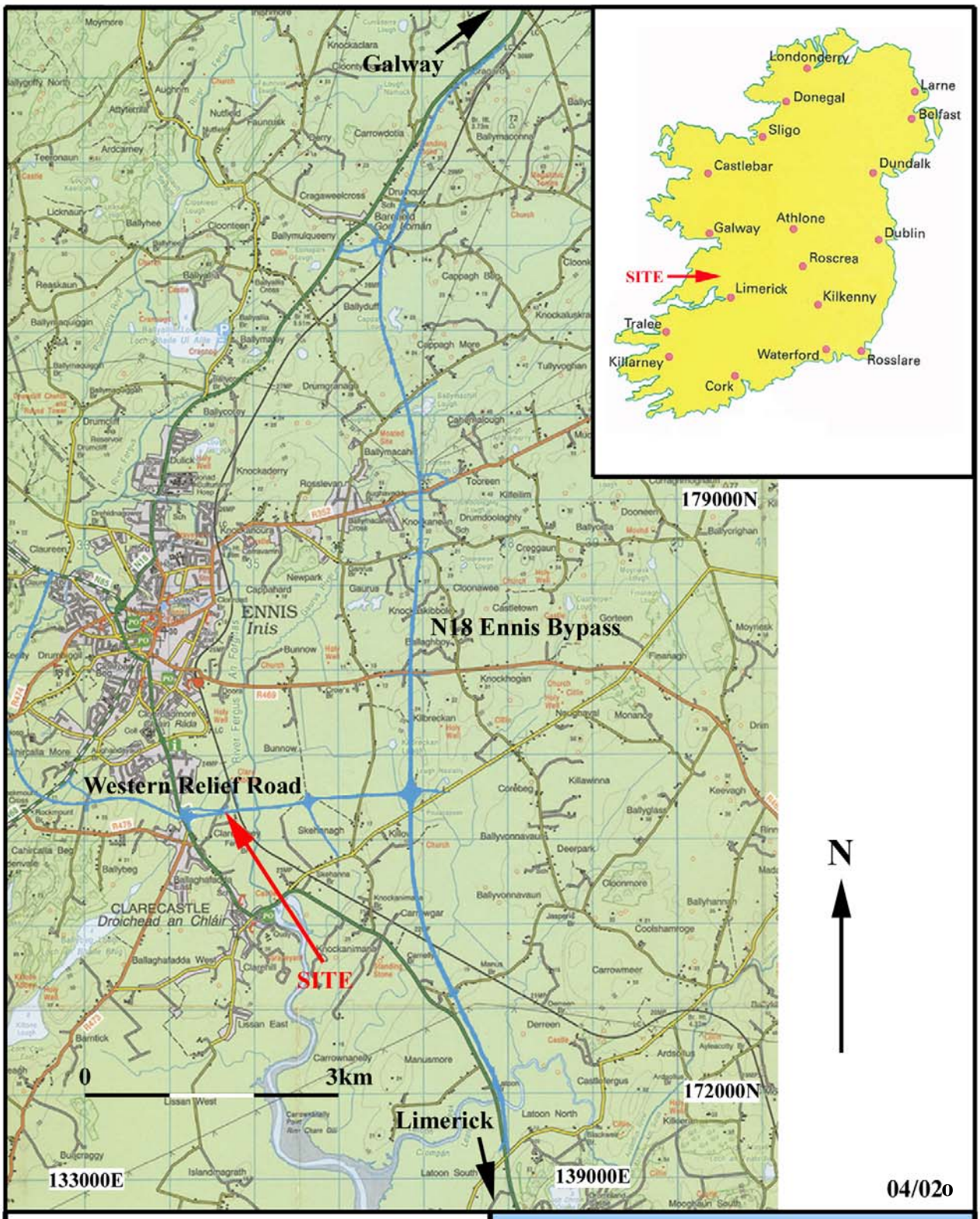
Cut	Deposit	Description	Samples	Finds
-	1	Topsoil	-	-
-	2	Natural geological deposits	-	-
5	4	Pit	1	-
7	6	Pit	5	-
-	9	Spread	2	-
11	10	Furrow	-	-
13	12	Furrow	-	-
15	14	Furrow	-	-
-	16	Spread – non-archaeological	-	-
-	17	Spread – non-archaeological	-	-
19	18, 20	Pit	3	-
21	22	Furrow	-	-
23	-	Cancelled	-	-
24	8	Pit	-	-
-	25	Spread	-	-
27	26	Furrow	-	-
28	3	Pit	4	-
30	29	Pit	-	-
33	31	Furrow	-	-
34	32	Furrow	-	-
38	35	Pit	6	-
39	35	Pit	6	-
40	36, 42, 45	Pit	9	1 = bone
41	37	Pit	7	-
44	43	Stone socket	-	-
46	49	Pit	8, 10	2 = bone
48	47	Stone socket	-	-

Appendix 2: Catalogue of artefacts

Find number	Cut	Deposit	Sample number	Category	No. of pieces	Weight (g)
1	40	45	-	Bone	10	22
2	46	49	8	Bone	2	<1

Appendix 3: Catalogue of samples

Sample number	Cut	Deposit	Volume sieved (L)	Volume floated (L)	Finds?	Stone sample?	Charred plant remains?
1	5	4	2	2	N	N	Y
2	-	9	5	5	N	N	Y
3	19	18	8	8	N	N	Y
4	28	3	2	2	N	N	Y
5	7	6	Stone	Stone	N	Y	N
6	38 & 39	35	-	-	-	-	-
7	41	37	18	18	N	Y	Y
8	46	49	20	20	Bone	Y	Y
9	Cancelled	-	-	-	-	-	-
10	46	49	In foil	In foil	N	N	Y



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N18 Ennis Bypass, Site AR122, Clareabbey, Co. Clare
04E0032

Figure 1: Site location

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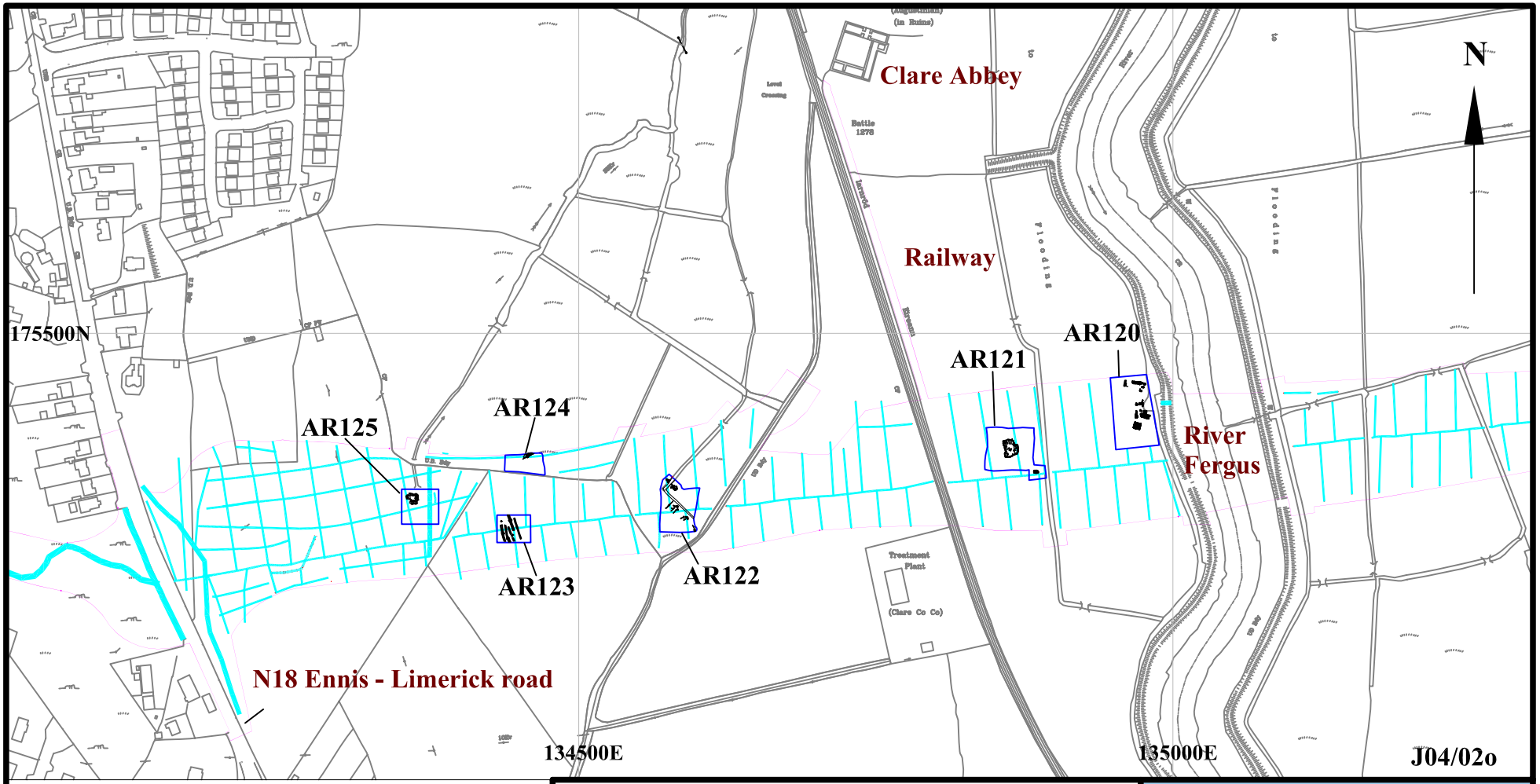

N18 Ennis Bypass, Site AR122, Clareabbey, Co. Clare

04E0032

Figure 2: Site location within local landscape.
Showing test trenches (03E1291)

Scale 1:5000. OSI Licence: AR0049406

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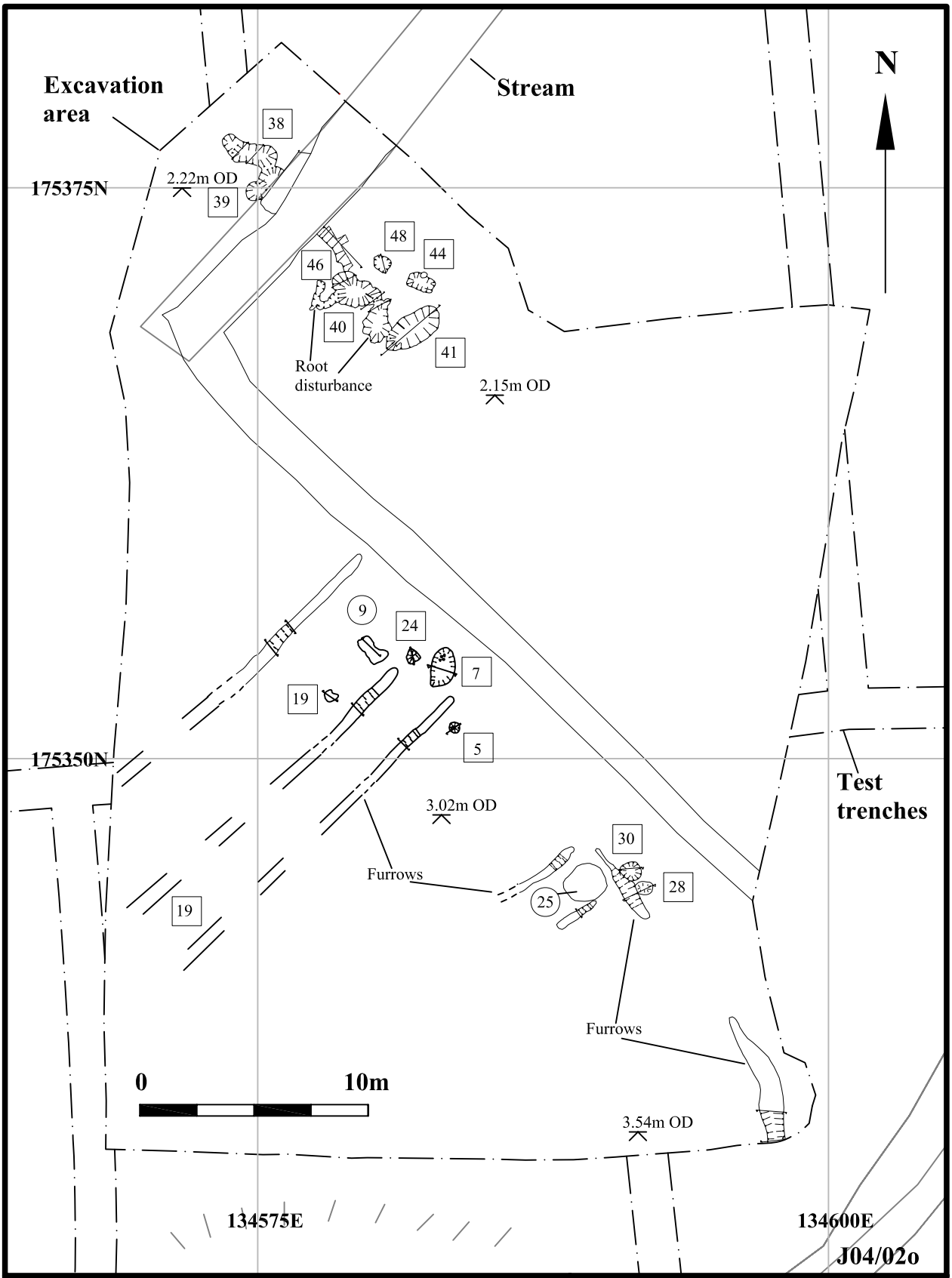

N18 Ennis Bypass, Site AR122, Clareabbey, Co. Clare

04E0032

Figure 3: Plan of site

Scale 1:250
OSI Licence: AR0049406

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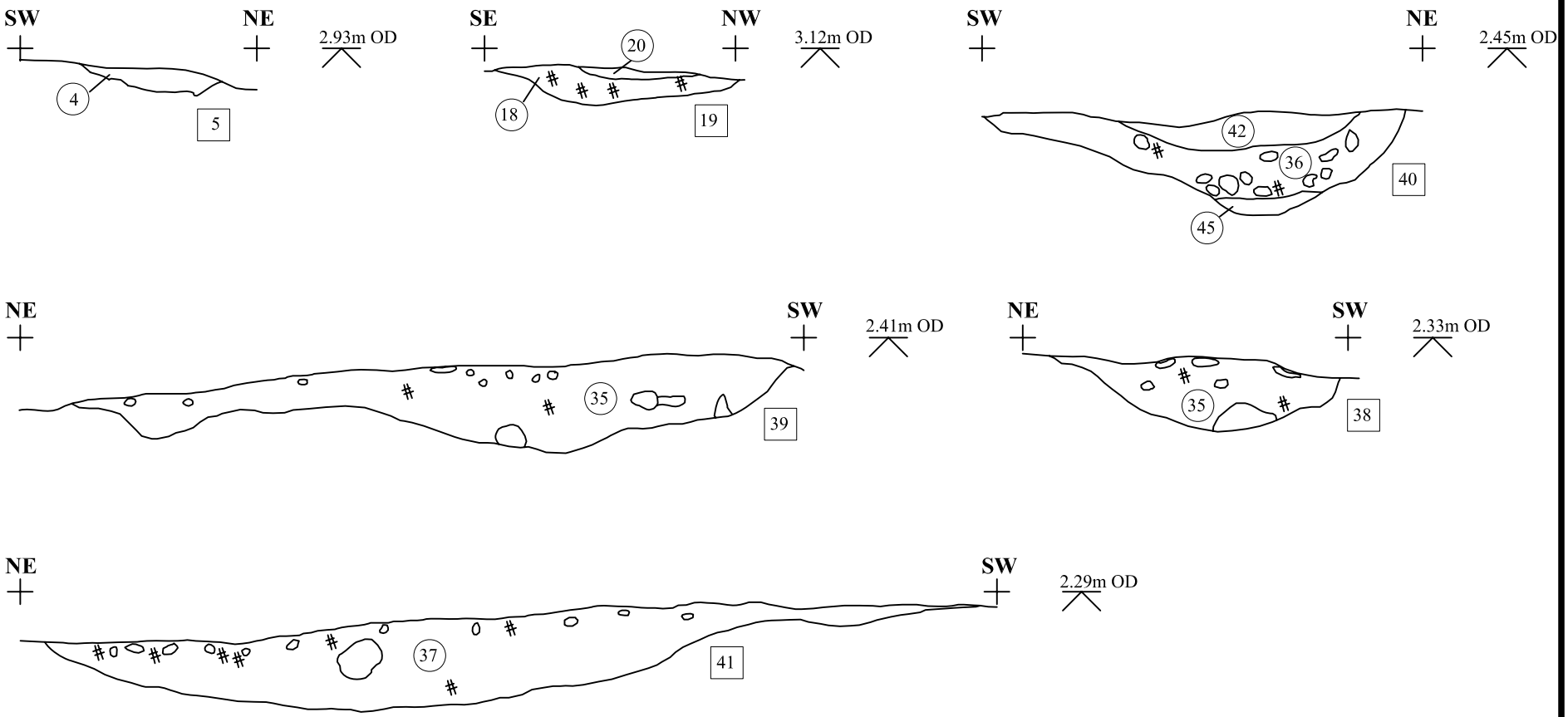

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N18 Ennis Bypass, Site AR122, Clareabbey, Co. Clare

04E0032

Figure 4: Sections of pits

Scale 1:20

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Plate 1. Site AR122 during excavation. Looking north. Clareabbey in background

Plate 2. Pit/trough 41 half-sectioned. Looking east. Scales 1m and 0.3m

Plate 3. Pit/trough 39 half-sectioned. Looking east. Scales 1m and 0.2m

Plate 4. Pit/trough 30. Looking south. Scale 0.3m